REMARKS

The present application was filed on October 6, 2000 with claims 1-20.

Claims 1-20 are currently pending in the application. Claims 1, 10, 19 and 20 are the independent claims.

Applicants again note that the present application claims the priority of U.S. provisional application Serial No. 60/165,802 filed November 16, 1999, although the Examiner has failed to provide an appropriate acknowledgment of this domestic priority claim in any of the Office Actions issued to date. The priority claim is properly acknowledged in the updated filing receipt dated April 5, 2001.

In the Office Action, claims 1-18 and 20 stand rejected under U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,014,694 (hereinafter "Aharoni"), and claim 19 stands rejected under U.S.C. §103(a) as being unpatentable over Aharoni in view of U.S. Patent No. 6,460,153 (hereinafter "Chou").

In this response, Applicants traverse the §102(e) and §103(a) rejections, and amend independent claims 1, 10, 19 and 20. Applicants respectfully request reconsideration of the present application in view of the above amendments and the following remarks.

With regard to the §102(e) rejection, Applicants note that the Manual of Patent Examining Procedure (MPEP), Eight Edition, August 2001, §2131, specifies that a given claim is anticipated "only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," citing Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, MPEP §2131 indicates that the cited reference must show the "identical invention . . . in as complete detail as is contained in the . . . claim," citing Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

For the reasons identified below, Applicants submit that the Examiner has failed to establish anticipation of at least independent claims 1, 10, 19 and 20 by the Aharoni reference.

The present invention as set forth in claim 1 is directed to a method of processing a video signal for transmission over a heterogeneous network. The method includes steps which recite coding the video signal in a progressive video coder, transmitting the progressive coded video bit

stream over a first part of the heterogeneous network at a first bit rate, and selectively transmitting one or more portions of the progressive coded video bit stream from the first part of the heterogenous network to a second part of the heterogenous network. The coding step further specifies that the progressive coded video bit stream is configured to be decodable at any one of a series of increasing bit rates up to a maximum bit rate, depending on which of a number of corresponding portions of the progressive coded video bit stream are received by a decoder, and that each of the series of increasing bit rates produces progressively better reconstructed video quality at an output of the decoder. The selectively transmitting step further specifies that the one or more portions are associated with a second one of the bit rates lower than the first bit rate, with the particular portions and the second bit rate being selected based at least in part on one or more of: (i) an error detected in the transmission over the first part of the heterogeneous network; and (ii) a characteristic of the second part of the heterogeneous network.

An illustrative example of a progressive coded video bit stream of a type falling within the above-described limitations of claim 1 is shown in FIG. 3 of the drawings, and is described as follows in the specification at page 10, lines 13-19:

> FIG. 3 shows a progressive coded video bit stream 300 generated by progressive video coder 110 from a given group of frames 310. The group of frames may represent, e.g., a group of pictures (GOP) as the term is used in conventional video coding standards, or any other type of video signal or image sequence. The bit stream 300 may be viewed as including a number of different portions, with a maximum target bit rate of 384 kbps achieved when all portions are received, and intermediate bit rates of 64 kbps, 128 kbps and 256 kbps being achieved if only first, second or third portions, respectively, are received.

The progressive coded video bit stream 300 in this example thus includes four distinct portions, as illustrated in the figure, with each of the portions corresponding generally to a different bit rate achievable upon receipt of that portion and any preceding portions in a decoder.

Applicants in their previous response, filed January 20, 2004, amended independent claims 1, 10, 19 and 20 to clarify the progressive video coding aspects of the present invention. More

specifically, each of these claims has been amended to specify that the portions of the progressive coded video bit stream are arranged within the progressive coded video bit stream in a predetermined sequence of increasing bit rates, from an initial portion associated with a lowest one of the bit rates to a final portion associated with a highest one of the bit rates.

In formulating the §102(e) rejection, the Examiner argues that each and every limitation of claim 1 as described above is disclosed in the Aharoni reference. Applicants respectfully disagree. As indicated above, the present invention as set forth in claim 1 specifically calls for coding a video signal in a progressive video coder so as to generate a progressive coded video bit stream configured to be decodable at any one of a series of increasing bit rates up to a maximum bit rate, depending on which of a number of corresponding portions of the progressive coded video bit stream are received by a decoder. Applicants note that the Aharoni reference makes no explicit reference to progressive video coding.

In their previous responses, Applicants indicated that the word "progressive" apparently does not appear anywhere in the Aharoni reference. The Examiner in the final Office Action at page 2, last two lines, to page 3, line 1, counters that the term "scaleable compression" as recited in Aharoni is anticipatory of the claimed progressive coding. However, the scaleable compression as recited in Aharoni is not progressive coding of the type claimed, but is instead layered video coding of a type similar to that described by Applicants in the background section of their specification, at page 1, line 30 to page 2, line 8, as follows:

> Other known video bit stream adaptation techniques have focused primarily on scalability of the video bit stream to different bandwidth conditions. For example, layered video coders have been developed which generate video bit streams consisting of several layers, usually a base layer followed by one or more enhancement layers, as described in S. McCanne, "Scalable Compression and Transmission of Internet Multicast Video," Ph.D. Thesis, University of California Berkeley, December 1996. The layered video coder allows users with greater bandwidth capability to subscribe to more layers, and thereby receive better video quality, while users with less bandwidth capability can subscribe to the base

layer only. This provides adaptive video quality for different users while minimizing the bandwidth inefficiency associated with transmission of the video at several different bit rates.

Thus, it appears that Aharoni discloses nothing more than a type of conventional layered video coding, and not the particular progressive video coding arrangement set forth in claim 1.

With regard to the previously-added limitation stating that the portions of the progressive coded video bit stream are arranged within the progressive coded video bit stream in a predetermined sequence of increasing bit rates, from an initial portion associated with a lowest one of the bit rates to a final portion associated with a highest one of the bit rates, the Examiner argues that the limitation is met by the teachings in column 11, line 60, to column 12, line 20, of Aharoni. Applicants respectfully disagree. The relied-upon portions of Aharoni simply show, for each of a number of different levels, "the average bandwidth necessary to transmit the data at that level." This is not a teaching that portions of a progressive coded bit stream are arranged in a predetermined sequence of increasing bit rates, for example, in the manner shown in FIG. 2 of the present application. Instead, the video stream as shown in FIG. 8 of Aharoni for a given group of pictures (GOP) includes data for only a single one of the levels, namely, Level 2, for each of the Key, B or P frames of the GOP. See, for example, column 10, lines 41-59, of Aharoni, which provides as follows, with emphasis supplied:

> The video server determines for each GOP the appropriate level of data to send to the client. Once a video quality level is chosen by the video server, it is used for the entire GOP. Adjacent GOPs can be comprised of different level data. However, data of different levels cannot be sent within a GOP.

Thus, Aharoni explicitly teaches that a given transmitted bit stream includes only a particular one of the five possible levels for a given GOP. It is therefore apparent that Aharoni not only fails to anticipate the claimed arrangement, but actively teaches away from it.

Accordingly, since Aharoni fails to teach or suggest "each and every element" of independent claim 1 in "as complete detail as is contained in the . . . claim," as required by MPEP §2131 for a proper anticipation rejection, claim 1 is not anticipated by Aharoni.

Independent claims 10, 19 and 20 as originally filed include limitations similar to those of claim 1, and are believed allowable for substantially the same reasons identified above with regard to claim 1.

Dependent claims 2-9 and 11-18 are believed allowable for at least the reasons identified above with regard to their respective independent claims. Moreover, certain of these claims are believed to define additional separately-patentable subject matter over Aharoni and the other art of record.

With regard to the §103(a) rejection over Aharoni and Chou, Applicants submit that the Chou reference fails to overcome the fundamental deficiency of the Aharoni reference as applied to independent claim 1. The §103(a) rejection is therefore believed to be improper and should be withdrawn.

Notwithstanding the foregoing traversal, Applicants have amended independent claims 1, 10, 19 and 20 to further clarify the progressive video coding aspects of the present invention. More specifically, each of these claims has been amended to specify that the progressive coded video bit stream comprises a plurality of frames of the video signal. See the specification at page 8, lines 26-27, and page 10, lines 13-16. Thus, the portions of the progressive coded video bit stream, which are specified in the claims as being arranged in a predetermined sequence of increasing bit rates, correspond to multiple frames of the video signal, such as a GOP. As indicated above, Aharoni explicitly teaches that data of different levels cannot be sent within a GOP.

Applicants also note that Aharoni at column 10, lines 34-36, states that every frame that is output by the video compression/file generator 14 of FIG. 1 "is composed of data from all five levels." Thus, there is no group of multiple frames of a video bit stream in Aharoni that will meet the claim limitation stating that the portions of the video bit stream are arranged within the video bit stream in a predetermined sequence of increasing bit rates, from an initial portion associated with a lowest one of the bit rates to a final portion associated with a highest one of the bit rates.

In view of the traversal, Applicants submit that the amendments to claims 1, 10, 19 and 20 are not made for reasons relating to patentability over Aharoni, Chou or any other art of record, but instead are made solely in order to expedite prosecution of the application.

Accordingly, Applicants believe that claims 1-20 as amended are in condition for allowance, and respectfully request the withdrawal of the §102(e) and §103(a) rejections.

Respectfully submitted,

Date: June 28, 2004

Joseph B. Ryan
Attorney for Applicant(s)
Reg. No. 37,922
Ryan, Mason & Lewis, LLP
90 Forest Avenue
Locust Valley, NY 11560
(516) 759-7517